MODIS sensor Working Group Minutes: July – Dec. 2001

18 July, 2001

MODIS sensor Working Group (MsWG) Summary

Attendance: Suraiya Ahmad, Bill Barnes, Bob Evans, Chris Moeller, Eric Vermote, Gary Toller, Jack Xiong, Mike Roberto, Roger Drake, Stuart Biggar, Vince Salomonson, Gwyn Fireman

Erratum: The 27 June 2001 minutes under "Moeller:" reads "Tested Band 24 crosstalk", where it should read "Tested Band 26 crosstalk".

Scheduled Items

Post-Anomaly RSB LUT Update Strategy

Science data collected over the three weeks that MODIS has been in normal operations with electronics side A (PS-1 and TCP-A) show that the instrument is performing largely as expected.

However, lookup tables used for processing at the DAAC are for electronics side B, so for the time being the calibrated L1B product (and downstream products) are invalid. For example, there is up to 5% difference in gain for RSB between A and B sides. (There is less impact on TEBs, as they are calibrated each scan).
Action 0107-01: Coordinate with the Goddard DAAC to post a warning about data taken with electronics side A, processed with LUTs for electronics side B.

The completed failure report is due August 1. There is a chance that MODIS may be switched back to electronics side B components (still with PS-1 and TCP-A), mid-August at earliest. At least six weeks of data will be collected using electronics side A.

MCST will deliver Side A LUTs as soon as possible. Except for the difference between A-side and B-side gain, the continuous trending curve for RSB will be maintained.

Two Solar Diffuser calibrations have been performed, but with ITWK/VDET at default value 79/190. One calibration with SD screen open has been analyzed; we are waiting for the second calibration set to be delivered.

Action 0107-02: Send Side A LUTs to Miami in parallel with delivery to the DAAC.
Action 0107-03: Process at least one granule through L1B with old and new LUTs for comparison; Eric Vermote will specify.

Questions remaining:

- Do we want to change SWIR band VDET from the default of 190 back to 110, the value used for electronics side B operations? The SWIR subframe difference may be affected.
- Detector gains were reset to defaults. Do we want to reduce Band 5 gain by 25% to reduce saturation as had been done on side B?
  Action 0107-04: Consult Steve Platnick - should Band 5 gain be changed for A-side operations?
- Should SRCA tests be performed to obtain side A crosstalk coefficients? Level-of-effort is a consideration if we intend to return to B-side electronics components. Any SRCA tests should be run *after* any VDET and gain changes.

Around the Table

Barnes:

- Santa Barbara analysis indicates that the observed FM1 Band 1 and 2 gain variability is most likely due to the SRCA having a variable source, not to changes in the detectors themselves.
- It is still under consideration whether to change the SDSM screen. Since the spacecraft is going into the vacuum chamber next week, any correction to the SDSM will have to wait until after thermal vacuum testing.

Roberto:

- The MODIS Anomaly Resolution Team has developed a likely scenario for the recent PS-2 failure: One of two MOSFETs became lossy. After a time, the non-lossy MOSFET could no longer compensate, leading to an overvoltage on the power supply.
- The team is trying to determine whether the anomaly was the result of a design problem or due to a high-energy particle hit, and whether to recommend that any FM1 power supply components need to be replaced. The spacecraft would likely be pulled out of the vacuum chamber to replace any electronics components to preserve the relevance of subsequent thermal vacuum testing.

Vermote:

Has implemented the new polarization correction; has questions for Miami regarding the best configuration.

Toller:

The crosstalk correction algorithm has been coded and is in testing.

Xiong:

- MCST has analyzed data collected since MODIS came back up on electronics side A on July 2. All detectors are functional, all SNR and NEdT values are within spec, and DN histograms show that the ADC pattern is as before for side A
- MCST is preparing FM1 charts for the September calibration workshop; we hope to have Thermal Vacuum system-level results by then.

Ahmad:
Will be attending the MsWG meetings as a representative of the Goddard DAAC.

Evans:
- Presented results at IGARSS. With new polarization correction applied, SST retrievals are within 2% of Pathfinder validation data.
- Before the blackbody heater was turned on, noise in L1A DN counts from electronics side A was observed to be comparable to that seen from electronics side B.

Moeller:
- Q: Why would we consider returning to side B electronics?
  A: Side B ADC is significantly less noisy for Bands 33 – 36; comparable for other bands.
- Preparing an SPIE paper comparing MODIS with ER-2 results. MODIS 11μ and 12μ bands are low by 0.5 degrees at 290K (top of atmosphere). Band 29 is cold by about 1K; there is band-to-band variation in MODIS calibration residual. There is no apparent mirror-side effect. A suggestion was made that it would be useful to perform comparisons at different temperatures; a relationship between temperature difference and absolute temperature could help to pinpoint the problem.
  Action 0107-05: Moeller will meet with MCST to discuss data comparing MODIS with ER-2 results.

Biggar:
- Q: Will the side A thermal LUTs have new a0 and a2 coefficients?
  A: Yes.
- Would find it useful if MCST could use new LUTs to process data corresponding to Railroad Valley field data.
  Action 0107-06: Use new LUTs to process data corresponding to Railroad Valley field data; dates and location will be specified by Stu Biggar.

Drake:
- TRW testing of FM-1 A-side SRCA spatial mode are satisfactory, within 2% in both scan and track. System-level CPT tests will start by the end of the week.
- Will talk with Jack on Thursday, 4:15 EDT.
- Will be on vacation for three weeks starting Monday; Jim Young will represent SBRS during that time.

compiled by G. Fireman 20 July, 2001